

**REMARKS**

Claims 1-8, 10-16, 19-27, and 30-39 are pending and under examination. Claims 1, 6, 19, 23, 30 and 33-36 have been amended. Support for the amendments can be found throughout the specification and the claims as filed. In particular, support for the amendment to claims 1, 6, 19, 23, 30 and 33 can be found, for example, on page 35, lines 18-20, page 47, lines 13-15 and page 58, lines 18-20. Claims 34-36 have also been amended to correct antecedent basis. Accordingly, these amendments do not raise an issue of new matter and entry thereof is respectfully requested. The Office Action mailed January 15, 2009, has been reviewed, and all rejections are respectfully traversed for the reasons that follow.

**Rejections Under 35 U.S.C. § 101**

Claims 1-8, 10-16, 19-27 and 30-39 stand rejected under 35 U.S.C. § 101 as allegedly being directed to non-statutory subject matter. The Examiner indicates that this is a new ground of rejection necessitated by the recent decision in *In re Bilski*.

*In re Bilski*, 545 F.3d 943, (Fed. Cir. 2008) held that a process claim defines patentable subject matter if “(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article to a different state or thing.” *Id.* at 954, 956 (citing *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972)). Applicants respectfully submit that the claimed invention meets either or both branches of this “machine-or-transformation” test articulated by the *Bilski* court.

The Examiner asserts that the claimed invention fails to physically transform an article or physical object to a different state or thing allegedly because the claims are directed to *in silico* method steps. The Examiner further asserts that method claims 1, 6, 23, 30 and 33 are not tied to a statutory class because the method steps critical to the invention are not tied to any particular apparatus or machine.

The question before the *Bilski* court was whether the claimed process recited a fundamental principle and, if so, whether it would pre-empt substantially all uses of that fundamental principle if allowed (see *Bilski*, fn 5 at 952, defining a fundamental principle to mean laws of nature, natural phenomena and abstract ideas). *Id.* at 954. The claims in issue were directed to a business method of hedging risk in the field of commodities trading. *Id.* at 949. The court held that the claimed method was not directed to patent-eligible subject matter because there was no transformation of an article into a different state or thing. With respect to

the machine implementation branch of a process claim, the *Bilski* court explicitly acknowledged that the question of whether a fundamental principle, when tied to a particular machine, would render the claims statutorily patentable under § 101 was not in issue in *Bilski*.

As to machine implementation, Applicants themselves admit that the language of claim 1 does not limit any process step to any specific machine or apparatus. As a result, issues specific to the machine implementation part of the test are not before us today.

*Id.* at 962.

The Examiner asserts in the Office Action that claims 1, 6, 23, 30 and 33 are not tied to a statutory class of invention “because the **method** steps that are critical to the invention are ‘not tied to any **particular apparatus or machine**’ and therefore do not meet the machine-or-transformation test as set forth in *In re Bilski*” (emphasis in original). Applicants respectfully point out that the *Bilski* court held that a process claim defines patentable subject matter if “(1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article to a different state or thing.” *Id.* at 954, 956 (citing *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972)). *In re Bilski* makes no assertion that “the method steps that are critical to the invention” be tied to any particular apparatus or machine. Rather, the *Bilski* court held that a process claim defines patentable subject matter if “it [the process claim] is tied to a particular machine or apparatus.”

Applicants respectfully submit that independent claims 1, 6, 23, 30 and 33 satisfy the machine implementation branch of the test. Claim 1, as amended, is directed to a method for modeling cellular metabolism of an organism and explicitly recites constructing on a computer a flux balance analysis model utilizing stoichiometric mass balances of metabolic and cellular composition information of the organism to identify stoichiometric boundaries for available flux distributions of a metabolic network. Claims 6, 23, 30 and 33, as amended, similarly explicitly recite “constructing on a computer” a flux balance analysis model. Thus, claims 1, 6, 23, 30 and 33 expressly recite that the flux balance analysis model is constructed on a computer and further recite that an output is provided to a user. Therefore, claims 1, 6, 23, 30 and 33 and their dependent claims satisfy the machine-or-transformation test because the methods for modeling cellular metabolism of an organism is implemented by a particular machine.

With respect to claim 19, Applicants submit that this claim also satisfies the machine-or-transformation test. Claim 19, as amended, explicitly recites that the flux balance analysis model of the system is contained on a computer readable medium and that the system contains commands for execution on a computer for producing an altered flux balance analysis model.

Therefore, Applicants respectfully submit that claim 19 and its dependent claims at least satisfy the machine implementation of the machine-or-transformation test.

The Examiner additionally asserts that the recited computer readable medium of claim 19 is drawn to non-statutory subject matter further “because a computer readable medium reads on carrier waves.” Applicants respectfully disagree and note for the record that the specification provides no teaching of a carrier wave. Therefore, whatever issues may apply to the non-statutory nature of a carrier wave are not applicable to the computer readable medium as recited in the claims.

In light of the above remarks and amendments, Applicants submit that the claimed invention falls within statutory patentable subject matter. The claims meet the machine-or-transformation test articulated in *Bilski* because the claimed method is tied to a computer. Accordingly, Applicants respectfully request that this ground of rejection be withdrawn.

#### Rejection Under 35 U.S.C. § 112, First Paragraph

Claims 19 and 34-36 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly being directed to new matter. Applicants respectfully maintain, for the reasons of record, that the specification provides sufficient description and guidance for claim 19 as amended in the previous response and for claims 34-36 as added in the previous response and that these claims are not directed to new matter. Nevertheless, to further prosecution, claim 19 has been amended to delete the phrase “computer readable medium having stored thereon a system for modeling cellular metabolism” and to recite that the flux balance analysis model is contained on a computer readable medium as recited in claim 19 prior to the previous amendment. Accordingly, Applicants respectfully submit that this rejection has been rendered moot and respectfully request that this rejection be withdrawn.

In light of the amendments and remarks herein, Applicants submit that the claims are now in condition for allowance and respectfully request a notice to this effect. The Examiner is invited to call the undersigned if there are any questions.

#### Conclusion

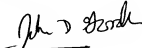
This is a request to extend the period for filing a response in the above-identified application for three months from April 15, 2009 to July 15, 2009. Applicant is a small entity; therefore, please charge

Deposit Account number 26-0084 in the amount of \$555.00 to cover the cost of the three month extension.

No other fees or extensions of time are believed to be due in connection with this amendment; however, consider this a request for any extension inadvertently omitted, and charge any additional fees to Deposit Account No. 26-0084.

Reconsideration and allowance is respectfully requested.

Respectfully submitted,



JOHN D. GOODHUE, Reg. No. 47,603  
McKEE, VOORHEES & SEASE, P.L.C.  
801 Grand Avenue, Suite 3200  
Des Moines, Iowa 50309-2721  
Phone No: (515) 288-3667  
Fax No: (515) 288-1338  
**CUSTOMER NO: 27407**  
Attorneys of Record

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